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A.D. 1795 . . . . . N° 2070.

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S P E C I F I C A T I O N

OF

JAMES WILLSON.

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SOCKS AND VAPOUR BATHS.

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LONDON:

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Socks and Vapour Baths.

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WILLSON'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, JAMES WILLSON, of the Parish of Saint Anns, in the County of Middlesex, send greeting.

WHEREAS His most Excellent Majesty King George the Third did, by  
5 His Letters Patent, under the Great Seal of Great Britain, bearing date at  
Westminster, the Twenty-second day of October, in the thirty-fifth year of  
His reign, give and grant unto me, the said James Willson, His especial  
licence that I, the said James Willson, during the term of years therein  
mentioned, should and lawfully might use, exercise, and vend, within England,  
10 Wales, and the Town of Berwick-upon-Tweed, my Invention of "A MODE OF  
PREVENTING IN A MATERIAL DEGREE THE EFFECTS OF MOISTURE ON THE HUMAN  
BODY, AND OF FACILITATING RELIEF IN INFLAMMATORY AND SPASMODIC COMPLAINTS  
ARISING FROM IT AND OTHER CAUSES;" in which said Letters Patent there is  
contained a proviso obliging me, the said James Willson, by an instrument in  
15 writing under my hand and seal, to cause a particular description of the nature  
of my said Invention, and in what manner the same is to be performed, to be  
inrolled in His Majesty's High Court of Chancery within one calendar month  
after the date of the said recited Letters Patent, as in and by the same  
(relation being thereunto had) may more fully and at large appear.



*Willson's Socks and Vapour Baths.*

NOW KNOW YE, that in compliance with the said proviso, I, the said James Willson, do hereby declare that my said Invention is described in the Drawings hereunto annexed, and the description thereof hereunder written, and in manner following, that is to say :—

The manner in which the objects expressed in my Patent are to be obtained 5 is, first, by a sock or covering to be worn over the stocking or next to the skin, made of the gut called by butchers the bung gut, of oxen, sheep, or swine, or the intestine of any animal, or of the exterior membrane called the paritonoaum, of those which afford one sufficiently strong, or of any skin or substance sufficiently close and ductile to be formed without a seam. They are first to 10 be cleansed by scraping and washing, and when the inside skins are to be preserved for use, inflated until dry, and then the air is discharged ; when required, they are to be immersed in water until they become pliant. The membrane may be immediately used without drying, and when necessary to be preserved, it is done by spreading on any smooth surface. The mode of forming the socks 15 is upon a last, consisting of five pieces, as described in the Drawing, and a key which serves the double purpose of connecting and separating, by screwing into the perpendicular and oblique centre pieces alternately, which when withdrawn, permit the others to be taken out when the sock is sufficiently dry. The bottom of the gut makes the neatest sock. Those who from gout or any 20 other complaint wish to envelope the foot or limb with a greater quantity, may make use of the entire skin as a roller, which will exclude the humidity from the surface of the earth, and, when rendered adhesive by any proper application from excluding the atmospheric air, may be used with effect in the dressing of certain wounds. The socks may be covered with any 25 varnish that sufficiently resists heat and moisture, a solution of elastic gum, the composition mentioned in Mr. Bellamy's Specification, for preparing leather, or some of the ingredients and proportions in it, and Mr. Angel's Brittannic Elastic Gum, if with consent or purchase from the Patentees, and if not, the same ingredients or some of them, so modified (which may be done 30 with effect) as not to interfere with any legal right of others. This is mentioned from the infinite changes that have been specified in different Patents, as it is well known to be impossible almost to suggest any which must not approach to one or the other. The elastic gum I can prove to have used for more than a year before I knew there was a Patent for it, and have found that 35 several preparations of it,—oil, glue, wax, letharge, umber, resin, and birdlime answer the purpose. I have used with effect one quart of best Dutch linseed oil, one ounce and half of letharge, one ounce and half of amber, one ounce and half of gypsum, and two ounces of the inspissated juice of holly, boiled



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to a proper consistency over a slow fire. On the manner of boiling and the quality of the oil (the first of which can only be attained by practice), chiefly depend the fitness of the composition, and it must be varied according to the ingredients.

5 The second object is effected by confining upon the surface of the body, or cooling and diluting with atmospheric air, the vapour produced by water, or any substance that may be combined with it, or the fume of dry substances alone, and preventing the vapour or fume from coming into contact with the lungs. This is to be done by an apparatus either stationary or portable. The  
 10 first in a room or rooms of suitable dimension, according to the number of baths, or in a room contiguous by means of a pipe. A boiler or steam vessel is to be fixed, adapted in quality and size to the substance it is to receive; in the boiler is to be inserted at the top, or in a dome, if so made, a stopcock with two pipes, one projected in a right line, the other standing at a right  
 15 angle, and so constructed that one must be always open. The first is to communicate by a tube with the lower part of a reservoir, of which the top and bottom are to be of tin, copper, or wood, and the sides of silk, linnen, leather, or other flexible substance, varnished with the same substance before mentioned, or any other which will retain the vapour. The other pipe is to connect  
 20 with a tube which will discharge into the open air through a perforation in the wall of the chamber. In the side of that reservoir at the bottom, is to be inserted the pipe of a pair of bellows with a conical valve and spiral spring on the pipe, as described in the Drawing, and compressing by ascent like those of a blacksmith. To the hole in the bellows, where the air is inhaled, is to be  
 25 attached a flexible tube made air-tight, and leading to the outside of the chamber to introduce atmospheric air. On the top of the reservoir is to be placed a small frame, as described in the Drawing, in which a thermometer is to be suspended, the ball of which is to be exposed to the contents of the reservoir by a tube of varnished silk at one end bound on it, and the other  
 30 nailed over an aperture beneath the frame. The lever of the bellows is to be directed to this place, to which also is to be conducted the bight of a cord, the ends of which are to be fastned to those of a bar across the key of the stopcock, where it is to act on the principle by which the rudder of a Thames wherry is managed, whence one man can govern the cock with one  
 35 hand, and with the other give action to the bellows, his eye fixed at the same time upon the thermometer. At the end of this reservoir, a few inches distant, is to be placed the bathing vessel, of tin, wood, marble, or any fit substance, about two thirds of which are to be covered, and on the other to be fixed a circular rim with a groove upon the outside to receive a circular piece of silk, varnished as before



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mentioned, and closely bound on the other end, folded back loose until in use. This vessel is to be connected with the reservoir by a stopcock with long pipe. In the inside of the bathing vessel is to be inserted the end of another tube which shall communicate with the external air, and terminating with a conical valve acting by a spiral spring, or any other which will yield to the force with 5 which the contents may be expelled when the vessel shall be surcharged to produce a renovation of vapour, or from any other cause, and then resume its place. The person then who conducts the bath, when the vapour is prepared, proceeds to fill the reservoir, of which the size may be, for accuracy, convenience, and expedition, in a fixed bath, of equal size with the bathing vessel, 10 and by regarding the thermometer, ascertain to the most exact degree the temperature at which the vapour may be required. That being done, the person who is to receive the bath is to be placed in the vessel, and the silk drawn up about his neck (but not extended), and bound on with a very elastic woollen roller, so tight as to retain the vapour, which will not, if properly 15 adjusted, produce any uneasiness or injury. The silk being loose shews, by dilating and collopsing, when the vessel is full. The cock between the reservoir and bathing vessel being then turned, the reservoir discharges its contents by suffering the top to sink from its own gravity or additional weight, and thereby discharging its contents, which being done, the cock is turned to confine the 20 vapour. The top is suspended in a frame by a cord passing over two brass rollers, to which a weight is attached, and on which a small pressure effects its elevation. If necessary it might be so accurately ballanced as to rise by the injection of the vapour and atmospheric air, or the top might be fixed and the bottom raised by a lever, as that of the bellows. That being done, the conductor re- 25 commences the operation of filling the reservoir a second time, or as often as may be necessary, and by returning to the cock which separates the bathing vessel and reservoir, evacuates and renews the vapour at pleasure, whence the morbid exhalation from the body is not only kept from coming into contact with the lungs, but uniformly carried off by means of the valved tube before 30 mentioned, yielding in obedience to the collapsing reservoir. When vapour is to be applied to a limb, cases of varnished silk, linnen, or any other flexible substance, bound at one or both ends as may be required, which will retain it, may be used, or of wood, tin, &c., with caps like those of the large bath. Where the part from its situation cannot be conveniently embraced by those means, 35 and it is found necessary to act partially upon a very small surface of the body, a concave circle of glass, tin, wood, or any suitable hard substance, and of any diameter, with the edges of any convenient form, with spherical caps of varnished silk, are to be made use of, applied to the skin, and the vapour



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conveyed to it by a flexible tube made air-tight, as those before mentioned, and a lateral tube, with a valve communicating with the external air, to renovate the vapour without removing the concave. When the application is to be of considerable length the concave is to be fastned to the part by elastic rollers  
5 attached to the most prominent part of it, and by that means accurately and steadily compressed. When the application is to be of shorter duration, the concave may be applied by hand, and by a momentary removal the vapour renewed without the assistance of a lateral tube and valve, if the substance should be only water, or something equally innoxious, as the quantity of vapour  
10 will be so small that it would be scarcely felt in the atmosphere of a chamber of moderate size, at least by a person whose lungs were not in a very infirm state; but the first method is the best and most accurate. When the fume of dry substances is to be extricated, instead of a boiler a retort, fire tube, or chafing dish, according to the substance, is to be used, and the atmospheric air  
15 withheld or admitted in whatever quantity may be required, which, as well as any other, may be ascertained if necessary by bags of varnished silk for the purpose; or, what will be a more expeditious mode, either to collect or emit by bellows, of which the contents have been measured, with a valve on the pipe, as the flexible tube communicating with the air hole of the bellows being  
20 introduced into any other body of air or vapour. It may be drawn in and injected with equal facility and dispatch, and a spring bolt or catch may be imposed to act when the bellows are extended to keep them so, and prevent any force upon the valve or possible escape. The portable bath is made upon the same general principle, with the following difference:—The boiler need  
25 not contain more than three or four quarts, which will suffice for any ordinary purpose of vapour bath, and is large enough to contain the other necessary apparatus, for which it forms a convenient case. The things required are first, the tubes, all of which must be flexible, made of thin leather or linen varnished, closely bound round brass spirals of a proper diameter. The cock, as described  
30 before, with a tube, which is to fit at one end by a screw or well, ground, the former into the boiler, the latter into a tin or copper vessel large enough to contain and form a travelling covering for the boiler, which from its frequent exposure to the fire requires one. This vessel for fume is immersed in one with water, if required, but serves here as a reservoir to blend the two bodies, and transmit  
35 them in one uniform current through a small tube to a bag of varnished silk, sufficiently large to envelope the whole or any part of the body that may be required. When for the entire body, it is to be bound round the neck as in the other bath, for a limb at each end. To the side of this also, as in the former, is to be attached a tube leading to the window, chimney, or keyhole of the



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chamber; when to the former it should terminate with a conical screw, which shall have way made for it by a gimblet, should none other appear. The only difference between the baths in effect is, that in the portable bath, the bellows are wrought by hands, or one if necessary, from an inward elevating spring, and that the diluted vapour is forced without interruption through an open 5 tube upon the body, without waiting for the preparation of a quantity equal to fill the whole bath. The bag where the vapours is to be received may be round at bottom, or might terminate in a cone about three feet in length, to let the greater volume approach the body at once, which, even without an intermediate vessel, would materially prevent exposure to the partial 10 streams of air and vapour which I have found effectual with care. The dilating and collopsing of the silk will tell when the bag is full, or otherwise, at which time the cock is to be turned, and the vapour is carried off as in the other bath, and the bellows cease until it is found necessary to renovate. By these means the effect of the vapour is equal to that produced 15 by the stationary bath, save only that of the preparation of the vapour in a large volume, which, where space cannot be conveniently found, may be there also dispensed with, as by a very moderate degree of experience or attention a smaller reservoir will suffice, and even the immediate introduction of the vapour and air separately into the bath, and the dilution being therein per- 20 formed, could not, without great mismanagement, produce any inconvenience, and the person bathed might in either cases command both streams himself by two cocks, as in a common warm water bath. In either of these cases the thermometer is to be suspended by a ribbond about the neck of the person bathing, and the ball exposed to the vapour by a tube of silk, as before 25 described, by which means it is visible to the patient or operator. In an apparatus where the vapour is to be blended in the bath, the lever of the bellows is to be moved by the foot of the conductor pressing on a stirrup attached to the end of it, by which means he has a hand disengaged for each cock. The same convenience may be had in using the portable bellows by the 30 motion of the arm, and being fastened as those of bagpipes. By either of the baths the means proposed for the recovery of drowned persons by the Humane Society may, it is ardently hoped, be materially augmented, and in those, as well as several other cases, the evanescent scintillations of life successfully excited.

The third method is, by augmenting the effects of æther, by continuing the 35 application of it to any part of the body, without the loss of evaporation which attends other methods. That is to be effected by the means of a very flat concave, as described in the Drawings, with two necks in the circumference



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opposite to each other. Into each of these are to be accurately fitted, by grinding, the necks of two flat phials of equal contents with the concave. In these are to be inserted transversely two plugs perforated as that a stopcock, which, being turned, open or close the passages. The upper phial being filled  
 5 with æther, or any other volatile or stimulating fluid, and the edges of the concave being brought into close contact with the skin, either by hand or by elastic bandages, the plug is turned to suffer the æther to descend into the concave, where it is confined upon the skin until the other is turned to admit it into the lower phial, where it is kept for use at another time, with very little  
 10 waste unless from accident. In the bottom of the upper phial is to be inserted a small stopper to admit air when the æther is descending. It may be right to observe, that when the fume of dry substances should require to be cooled, I have also passed it thro' a coiled tube immersed in a pail of cold water; and to save some part of the time in changing of water when it became heated, I  
 15 have used a syphon, which carries off the hot, and is supported by three legs, which are, as the tubes of the syphon, connected by screws to render it the more portable. In stationary baths a cock in the vessel that contains the tube, and one in a large elevated reservoir, answers the purpose.

## DESCRIPTION OF THE DRAWINGS.

20 No. 1 *a*, the boiler; *b*, the dome; *c*, the tube leading to the reservoir; *d*, another tube communicating with the atmospheric air by a perforation in the wall of the chamber; *e*, a stopcock with two pipes, one of which connects with that tube, the other projecting to the bottom of the reservoir *f*; *g, g*, frame and bellows compressing by ascent; *h*, a flexible tube attached to the air hole  
 25 of the bellows, and leading, as the other, to the atmosphere; *i*, the conductor of the bath, with the lever of the bellows in one hand, and the bight of the cord in the other that governs the cock looking on the thermometer *k*, suspended by the frame *l*; *m*, the top of the reservoir, suspended by the frame cords, &c., *n, n, n*; *o*, the tube and cock which admits the prepared vapour  
 30 into the bathing vessel *p*; *q*, a tube with a conical valve which carries off the vapour when the bath is surcharged for the purpose of renovation; *r*, the silk bound round the rim of the bathing vessel; *s*, the receiver of a conical valve; *t*, the conical valve; *u*, the spiral spring which supports it; *w*, the cock with two pipes; *x*, a concave glass for topical application, with the tube to  
 35 receive the vapour, and one valved to carry it off from a lateral apperture; 1, 1, two flat phials to contain æther; 2, the flat concave; 3, the transverse stock plug in the neck of the upper phial; the lower phial is described detached.



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2d Drawing. *a*, the last connected; *b*, the key; *c*, the oblique centre piece; *d*, the sides; *e*, the perpendicular centre piece; *f*, the heel.

In witness whereof, I, the said James Willson, have hereunto set my hand and seal, this Seventeenth day of November, One thousand seven hundred and ninety-five.

5

JAMES WILLSON. (L.S.)

E. LEEDS. AND BE IT REMEMBERED, that on the same Seventeenth day of November, in the year above written, the aforesaid James Willson came before our Lord the King in His Chancery, and acknowledged the Specification aforesaid, and all and every thing therein contained, in form above written. 10 And also the Specification aforesaid was stamped according to the tenor of the Statute in that case made and provided.

Inrolled the Twentieth day of November, in the year above-written.

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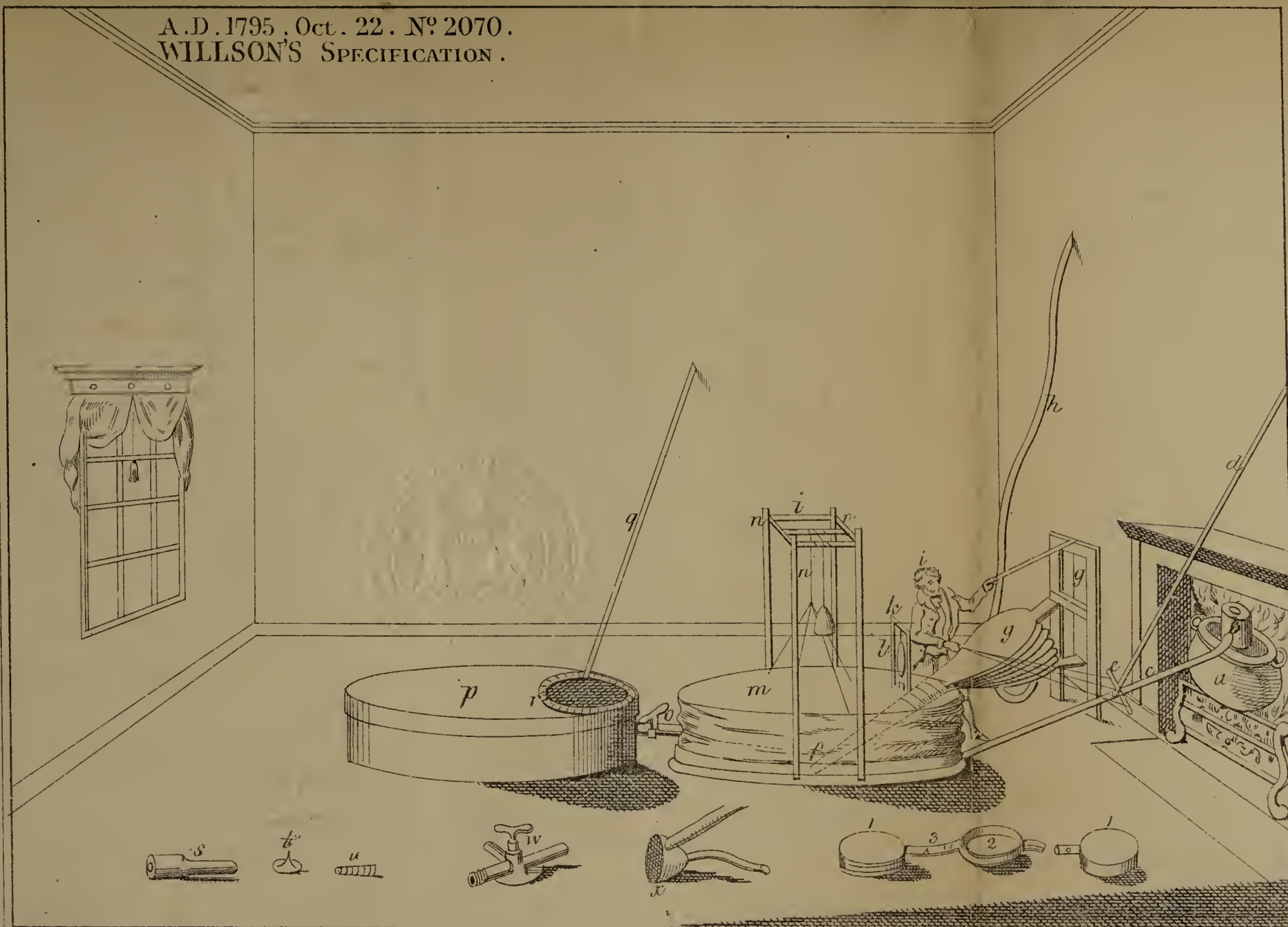
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A.D. 1795 . Oct . 22 . N<sup>o</sup> 2070 .  
WILLSON'S SPECIFICATION .

(2 SHEETS)  
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The enrolled drawing is altered.

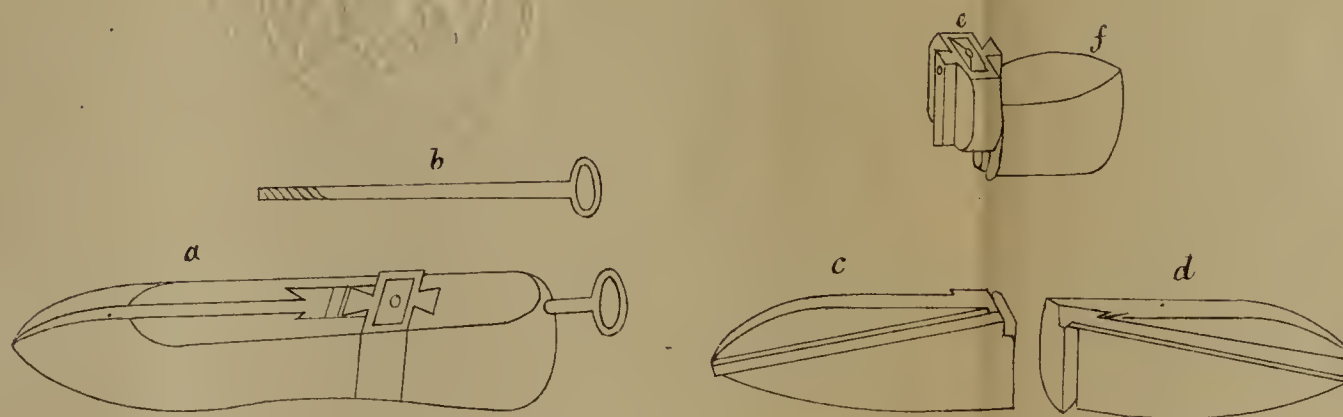
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